CLAIMS

What is claimed is:

1. A method for generating hardness information of tissue subject to a varying pressure, the method comprising:

receiving signals from a tissue with a sensor for measuring the deformation of the tissue in a measuring plane defined by the sensor, which sensor, during a varying pressure exerted on the tissue, is moved along the tissue in a direction transverse to the measuring plane;

identifying strain of the tissue from the resulting signals; and

relating the strain to elasticity, hardness or hardness and elasticity parameters of the tissue.

2. The method according to claim 1, wherein the method comprises:

correlating signals consecutive over time, which signals are representative of the deformation of the tissue in case of positions of the sensor mutually moved with respect to each other; and

calculating, by means of said correlation, strain in a tissue surface or tissue volume part extending practically parallel to the direction of motion of the sensor.

3. The method according to claim 1 or claim 2, wherein the method comprises the step of displaying elasticity and/or hardness parameters of a tissue surface or tissue volume part.

4. The method according to claim 1, claim 2, or claim 3 wherein the signals are echographic data detected with an acoustic sensor.

5. The method according to claim 1, claim 2, claim 3, or claim 4 wherein the signals are optical data detected with an optical sensor.

6. The method according to claim 1, claim 2, claim 3, claim 4, or claim 5, wherein the method comprises displaying elasticity and/or hardness parameters of the tissue with position information of the sensor and/or the tissue.

7. The method according to claim 1, claim 2, claim 3, claim 4, claim 5, or claim 6 wherein the signals are received during practically continuous motion of the sensor.

8. The method according to claim 1, claim 2, claim 3, claim 4, claim 5, claim 6, or claim 7 wherein signals possessing an overlap are received.

9. The method according to claim 8, wherein an optimum overlap is determined by means of a probability function displaying the similarity between consecutive signals.

10. The method according to claim 1, claim 2, claim 3, claim 4, claim 5, claim 6, claim 7, claim 8, or claim 9 wherein signals, at an assumed cyclic pressure change, are received at predetermined time intervals in the period of the motion.

11. The method according to claim 1, claim 2, claim 3, claim 4, claim 5, claim 6, claim 7, claim 8, claim 9, or claim 10, wherein the signals come from a blood vessel wall and the data are received only during a specific time interval of the period of the heartbeat.

12. The method according to claim 1, claim 2, claim 3, claim 4, claim 5, claim 6, claim 7, claim 8, claim 9, claim 10, or claim 11, wherein the tissue is an artery moving through the heartbeat in the longitudinal direction, and the sensor is moved practically parallel to this direction, so that, during at least one detection period, the sensor has a practically fixed position relative to the wall of the artery.

13. An apparatus for generating hardness information of tissue subject to a varying pressure, wherein the apparatus comprises:

a sensor movable through a blood vessel or body cavity for recording signals from a tissue;

a processor device for collecting and processing signals from the sensor to identify strain of the tissue and to relate the strain to elasticity and/or hardness parameters of a tissue surface or tissue volume part; and

a display device for displaying elasticity and/or hardness parameters of the tissue surface or tissue volume part.

14. The apparatus of claim 13, wherein the apparatus comprises:

correlation detection means for detecting the correlation between consecutive signals, which signals are representative of the deformation of the tissue in case of positions of the sensor mutually moved with respect to each other;

the processor device being arranged to calculate by means of said correlation a strain in a tissue surface or tissue volume part extending practically parallel to the direction of motion of the sensor.

15. The apparatus of claim 13 or claim 14, wherein the apparatus further comprises:

a position recording means coupled with the processor device to record sensor positions.

16. The apparatus of claim 13, claim 14, or claim 15, wherein the apparatus further comprises:

an actuator for moving the sensor.

17. The apparatus of claim 16, wherein the actuator has an adjustable speed of motion.

18. The apparatus of claim 13, claim 14, claim 15, claim 16, or claim 17, wherein the apparatus further comprises:

first activating means for activating data storage means for storing signals.

19. The apparatus of any one of claims 13-18, wherein the apparatus comprises: second activating means for activating the actuator.

20. The apparatus of claim 18 or claim 19, wherein the activating means can be connected with an ECG recording device to become active during a predetermined part of the heartbeat.

21. The apparatus of claim 18, claim 19, or claim 20, wherein the activating means are connected with the correlation detection means to become active at a predetermined correlation.

22. The apparatus of any one of claims 13-21, wherein the sensor is arranged in a catheter, which can be inserted into a blood vessel, the sensor recording signals under controlled pullback of the catheter.

23. The apparatus of any one of claims 13-22, wherein the sensor is an acoustic sensor.

24. The apparatus of any one of claims 13-22, wherein the sensor is an optical sensor.